

1

SEQUENCE LISTING

<110> SunGene GmbH & Co KGaA

<120> A process for preparing zeaxanthin and/or biosynthetic intermediates and/or secondary products thereof

<130> NAE 439/02

<160> 43

<170> PatentIn version 3.1

<210> 1

<211> 777

<212> DNA

<213> Arabidopsis thaliana

<220>

<221> promoter

<222> (1)..(777)

<223>

<400> 1

```
gagctcactc actgatttcc attgcttgaa aattgatgat gaactaagat caatccatgt      60
tagtttcaaa acaacagtaa ctgtggccaa cttagttttg aaacaacact aactggtcga      120
agcaaaaaga aaaaagagtt tcatcatata tctgatttga tggactgttt ggagtttagga      180
ccaaacatta tctacaaaca aagacttttc tcttaacttg tgattccttc ttaaacccta      240
ggggtaatat tctattttcc aaggatcttt agttaaaggc aaatccggga aattattgta      300
atcatttggg gaaacatata aaagatttga gttagatgga agtgacgatt aatccaaaca      360
tatatatctc tttcttctta tttcccaaat taacagacaa aagtagaata ttggctttta      420
acaccaatat aaaaacttgc ttcacaccta aacacttttg tttacttttag ggtaagtgca      480
aaaagccaac caaatccacc tgactgatt  tgacgtttac aaacgccgtt aagtogatgt      540
ccgttgattt aaacagtgtc ttgtaattaa aaaaatcagt ttacataaat ggaaaattta      600
tcacttagtt ttcatcaact tctgaactta cttttcatgg attaggcaat actttccatt      660
tttagtaact caagtggaac ctttacttct tcaactccat ctctctcttt ctatttcact      720
tctttcttct cattatatct cttgtcctct ccaccaaata tcttcaacaa aaagctt      777
```

<210> 2

<211> 195

<212> DNA

<213> Potato

<220>
 <221> Intron
 <222> (1)..(195)
 <223>

<400> 2
 tacgtaagtt tctgcttcta cctttgatat atatataata attatcatta attagtagta 60
 atataatatt tcaaataattt ttttcaaaat aaaagaatgt agtatatagc aattgctttt 120
 ctgtagttta taagtgtgta tattttaatt tataactttt ctaatatatg accaaaattt 180
 gttgatgtgc agctg 195

<210> 3
 <211> 212
 <212> DNA
 <213> artificial sequence

<220>
 <221> Intron
 <222> (1)..(212)
 <223>

<400> 3
 gtcgactacg taagtttctg cttctacctt tgatatatat ataataatta tcattaatta 60
 gtagtaatat aatatttcaa atattttttt caaaataaaa gaatgtagta tatagcaatt 120
 gcttttctgt agtttataag tgtgtatatt ttaatttata acttttctaa tatatgacca 180
 aaatttgttg atgtgcaggt atcaccggat cc 212

<210> 4
 <211> 1830
 <212> DNA
 <213> Tagetes erecta

<220>
 <221> CDS
 <222> (141)..(1691)
 <223>

<400> 4
 ggcacgaggc aaagcaaagg ttgtttgttg ttgttggtga gagacactcc aatccaaaca 60
 gatacaaggc gtgactggat atttctctct cgttcctaac aacagcaacg aagaagaaaa 120
 agaatcatta ctaacaatca atg agt atg aga gct gga cac atg acg gca aca 173
 Met Ser Met Arg Ala Gly His Met Thr Ala Thr
 1 5 10

3

atg gcg gct ttt aca tgc cct agg ttt atg act agc atc aga tac acg	221
Met Ala Ala Phe Thr Cys Pro Arg Phe Met Thr Ser Ile Arg Tyr Thr	
15 20 25	
aag caa att aag tgc aac gct gct aaa agc cag cta gtc gtt aaa caa	269
Lys Gln Ile Lys Cys Asn Ala Ala Lys Ser Gln Leu Val Val Lys Gln	
30 35 40	
gag att gag gag gaa gaa gat tat gtg aaa gcc ggt gga tgc gag ctg	317
Glu Ile Glu Glu Glu Glu Asp Tyr Val Lys Ala Gly Gly Ser Glu Leu	
45 50 55	
ctt ttt gtt caa atg caa cag aat aag tcc atg gat gca cag tct agc	365
Leu Phe Val Gln Met Gln Gln Asn Lys Ser Met Asp Ala Gln Ser Ser	
60 65 70 75	
cta tcc caa aag ctc cca agg gta cca ata gga gga gga gga gac agt	413
Leu Ser Gln Lys Leu Pro Arg Val Pro Ile Gly Gly Gly Gly Asp Ser	
80 85 90	
aac tgt ata ctg gat ttg gtt gta att ggt tgt ggt cct gct ggc ctt	461
Asn Cys Ile Leu Asp Leu Val Val Ile Gly Cys Gly Pro Ala Gly Leu	
95 100 105	
gct ctt gct gga gaa tca gcc aag cta ggc ttg aat gtc gca ctt atc	509
Ala Leu Ala Gly Glu Ser Ala Lys Leu Gly Leu Asn Val Ala Leu Ile	
110 115 120	
ggc cct gat ctt cct ttt aca aat aac tat ggt gtt tgg gag gat gaa	557
Gly Pro Asp Leu Pro Phe Thr Asn Asn Tyr Gly Val Trp Glu Asp Glu	
125 130 135	
ttt ata ggt ctt gga ctt gag ggc tgt att gaa cat gtt tgg cga gat	605
Phe Ile Gly Leu Gly Leu Glu Gly Cys Ile Glu His Val Trp Arg Asp	
140 145 150 155	
act gta gta tat ctt gat gac aac gat ccc att ctc ata ggt cgt gcc	653
Thr Val Val Tyr Leu Asp Asp Asn Asp Pro Ile Leu Ile Gly Arg Ala	
160 165 170	
tat gga cga gtt agt cgt gat tta ctt cac gag gag ttg ttg act agg	701
Tyr Gly Arg Val Ser Arg Asp Leu Leu His Glu Glu Leu Leu Thr Arg	
175 180 185	
tgc atg gag tca ggc gtt tca tat ctg agc tcc aaa gtg gaa cgg att	749
Cys Met Glu Ser Gly Val Ser Tyr Leu Ser Ser Lys Val Glu Arg Ile	
190 195 200	
act gaa gct cca aat ggc cta agt ctc ata gag tgt gaa ggc aat atc	797
Thr Glu Ala Pro Asn Gly Leu Ser Leu Ile Glu Cys Glu Gly Asn Ile	
205 210 215	
aca att cca tgc agg ctt gct act gtc gct tct gga gca gct tct gga	845
Thr Ile Pro Cys Arg Leu Ala Thr Val Ala Ser Gly Ala Ala Ser Gly	
220 225 230 235	
aaa ctt ttg cag tat gaa ctt ggc ggt ccc cgt gtt tgc gtt caa aca	893

Lys	Leu	Leu	Gln	Tyr	Glu	Leu	Gly	Gly	Pro	Arg	Val	Cys	Val	Gln	Thr	
				240					245					250		
gct	tat	ggt	ata	gag	gtt	gag	gtt	gaa	agc	ata	ccc	tat	gat	cca	agc	941
Ala	Tyr	Gly	Ile	Glu	Val	Glu	Val	Glu	Ser	Ile	Pro	Tyr	Asp	Pro	Ser	
			255					260					265			
cta	atg	gtt	ttc	atg	gat	tat	aga	gac	tac	acc	aaa	cat	aaa	tct	caa	989
Leu	Met	Val	Phe	Met	Asp	Tyr	Arg	Asp	Tyr	Thr	Lys	His	Lys	Ser	Gln	
		270					275					280				
tca	cta	gaa	gca	caa	tat	cca	aca	ttt	ttg	tat	gtc	atg	cca	atg	tct	1037
Ser	Leu	Glu	Ala	Gln	Tyr	Pro	Thr	Phe	Leu	Tyr	Val	Met	Pro	Met	Ser	
	285					290					295					
cca	act	aaa	gta	ttc	ttt	gag	gaa	act	tgt	ttg	gct	tca	aaa	gag	gcc	1085
Pro	Thr	Lys	Val	Phe	Phe	Glu	Glu	Thr	Cys	Leu	Ala	Ser	Lys	Glu	Ala	
300				305					310					315		
atg	cct	ttt	gag	tta	ttg	aag	aca	aaa	ctc	atg	tca	aga	tta	aag	act	1133
Met	Pro	Phe	Glu	Leu	Leu	Lys	Thr	Lys	Leu	Met	Ser	Arg	Leu	Lys	Thr	
			320					325					330			
atg	ggg	atc	cga	ata	acc	aaa	act	tat	gaa	gag	gaa	tgg	tca	tat	att	1181
Met	Gly	Ile	Arg	Ile	Thr	Lys	Thr	Tyr	Glu	Glu	Glu	Trp	Ser	Tyr	Ile	
			335					340					345			
cca	gta	ggt	gga	tcc	tta	cca	aat	acc	gag	caa	aag	aac	ctt	gca	ttt	1229
Pro	Val	Gly	Gly	Ser	Leu	Pro	Asn	Thr	Glu	Gln	Lys	Asn	Leu	Ala	Phe	
		350					355					360				
ggt	gct	gct	gct	agc	atg	gtg	cat	cca	gcc	aca	gga	tat	tcg	gtt	gta	1277
Gly	Ala	Ala	Ala	Ser	Met	Val	His	Pro	Ala	Thr	Gly	Tyr	Ser	Val	Val	
	365					370					375					
aga	tca	ctg	tca	gaa	gct	cct	aat	tat	gca	gca	gta	att	gca	aag	att	1325
Arg	Ser	Leu	Ser	Glu	Ala	Pro	Asn	Tyr	Ala	Ala	Val	Ile	Ala	Lys	Ile	
380				385					390						395	
tta	ggg	aaa	gga	aat	tca	aaa	cag	atg	ctt	gat	cat	gga	aga	tac	aca	1373
Leu	Gly	Lys	Gly	Asn	Ser	Lys	Gln	Met	Leu	Asp	His	Gly	Arg	Tyr	Thr	
			400					405					410			
acc	aac	atc	tca	aag	caa	gct	tgg	gaa	aca	ctt	tgg	ccc	ctt	gaa	agg	1421
Thr	Asn	Ile	Ser	Lys	Gln	Ala	Trp	Glu	Thr	Leu	Trp	Pro	Leu	Glu	Arg	
			415					420					425			
aaa	aga	cag	aga	gca	ttc	ttt	ctc	ttt	gga	tta	gca	ctg	att	gtc	cag	1469
Lys	Arg	Gln	Arg	Ala	Phe	Phe	Leu	Phe	Gly	Leu	Ala	Leu	Ile	Val	Gln	
		430					435					440				
atg	gat	att	gag	ggg	acc	cgc	aca	ttc	ttc	cgg	act	ttc	ttc	cgc	ttg	1517
Met	Asp	Ile	Glu	Gly	Thr	Arg	Thr	Phe	Phe	Arg	Thr	Phe	Phe	Arg	Leu	
	445					450				455						
ccc	aca	tgg	atg	tgg	tgg	ggg	ttt	ctt	gga	tct	tcg	tta	tca	tca	act	1565
Pro	Thr	Trp	Met	Trp	Trp	Gly	Phe	Leu	Gly	Ser	Ser	Leu	Ser	Ser	Thr	

460 465 470 475

gac ttg ata ata ttt gcg ttt tac atg ttt atc ata gca ccg cat agc 1613
 Asp Leu Ile Ile Phe Ala Phe Tyr Met Phe Ile Ile Ala Pro His Ser
 480 485 490

ctg aga atg ggt ctg gtt aga cat ttg ctt tct gac ccg aca gga gga 1661
 Leu Arg Met Gly Leu Val Arg His Leu Leu Ser Asp Pro Thr Gly Gly
 495 500 505

aca atg tta aaa gcg tat ctc acg ata taa ataactctag tcgcgatcag 1711
 Thr Met Leu Lys Ala Tyr Leu Thr Ile
 510 515

tttagattat aggcacatct tgcatatata tatgtataaa ccttatgtgt gctgtatcct 1771

tacatcaaca cagtcattaa ttgtatttct tggggtaatg ctgatgaagt attttctgg 1830

<210> 5
 <211> 516
 <212> PRT
 <213> Tagetes erecta

<400> 5

Met Ser Met Arg Ala Gly His Met Thr Ala Thr Met Ala Ala Phe Thr
 1 5 10 15

Cys Pro Arg Phe Met Thr Ser Ile Arg Tyr Thr Lys Gln Ile Lys Cys
 20 25 30

Asn Ala Ala Lys Ser Gln Leu Val Val Lys Gln Glu Ile Glu Glu Glu
 35 40 45

Glu Asp Tyr Val Lys Ala Gly Gly Ser Glu Leu Leu Phe Val Gln Met
 50 55 60

Gln Gln Asn Lys Ser Met Asp Ala Gln Ser Ser Leu Ser Gln Lys Leu
 65 70 75 80

Pro Arg Val Pro Ile Gly Gly Gly Gly Asp Ser Asn Cys Ile Leu Asp
 85 90 95

Leu Val Val Ile Gly Cys Gly Pro Ala Gly Leu Ala Leu Ala Gly Glu
 100 105 110

Ser Ala Lys Leu Gly Leu Asn Val Ala Leu Ile Gly Pro Asp Leu Pro
 115 120 125

Phe Thr Asn Asn Tyr Gly Val Trp Glu Asp Glu Phe Ile Gly Leu Gly
 130 135 140

Leu Glu Gly Cys Ile Glu His Val Trp Arg Asp Thr Val Val Tyr Leu
 145 150 155 160

Asp Asp Asn Asp Pro Ile Leu Ile Gly Arg Ala Tyr Gly Arg Val Ser
 165 170 175

Arg Asp Leu Leu His Glu Glu Leu Leu Thr Arg Cys Met Glu Ser Gly
 180 185 190

Val Ser Tyr Leu Ser Ser Lys Val Glu Arg Ile Thr Glu Ala Pro Asn
 195 200 205

Gly Leu Ser Leu Ile Glu Cys Glu Gly Asn Ile Thr Ile Pro Cys Arg
 210 215 220

Leu Ala Thr Val Ala Ser Gly Ala Ala Ser Gly Lys Leu Leu Gln Tyr
 225 230 235 240

Glu Leu Gly Gly Pro Arg Val Cys Val Gln Thr Ala Tyr Gly Ile Glu
 245 250 255

Val Glu Val Glu Ser Ile Pro Tyr Asp Pro Ser Leu Met Val Phe Met
 260 265 270

Asp Tyr Arg Asp Tyr Thr Lys His Lys Ser Gln Ser Leu Glu Ala Gln
 275 280 285

Tyr Pro Thr Phe Leu Tyr Val Met Pro Met Ser Pro Thr Lys Val Phe
 290 295 300

Phe Glu Glu Thr Cys Leu Ala Ser Lys Glu Ala Met Pro Phe Glu Leu
 305 310 315 320

Leu Lys Thr Lys Leu Met Ser Arg Leu Lys Thr Met Gly Ile Arg Ile
 325 330 335

Thr Lys Thr Tyr Glu Glu Glu Trp Ser Tyr Ile Pro Val Gly Gly Ser
 340 345 350

7

Leu Pro Asn Thr Glu Gln Lys Asn Leu Ala Phe Gly Ala Ala Ala Ser
 355 360 365

Met Val His Pro Ala Thr Gly Tyr Ser Val Val Arg Ser Leu Ser Glu
 370 375 380

Ala Pro Asn Tyr Ala Ala Val Ile Ala Lys Ile Leu Gly Lys Gly Asn
 385 390 395 400

Ser Lys Gln Met Leu Asp His Gly Arg Tyr Thr Thr Asn Ile Ser Lys
 405 410 415

Gln Ala Trp Glu Thr Leu Trp Pro Leu Glu Arg Lys Arg Gln Arg Ala
 420 425 430

Phe Phe Leu Phe Gly Leu Ala Leu Ile Val Gln Met Asp Ile Glu Gly
 435 440 445

Thr Arg Thr Phe Phe Arg Thr Phe Phe Arg Leu Pro Thr Trp Met Trp
 450 455 460

Trp Gly Phe Leu Gly Ser Ser Leu Ser Ser Thr Asp Leu Ile Ile Phe
 465 470 475 480

Ala Phe Tyr Met Phe Ile Ile Ala Pro His Ser Leu Arg Met Gly Leu
 485 490 495

Val Arg His Leu Leu Ser Asp Pro Thr Gly Gly Thr Met Leu Lys Ala
 500 505 510

Tyr Leu Thr Ile
 515

<210> 6
 <211> 445
 <212> DNA
 <213> tagetes erecta

<220>
 <221> sense fragment
 <222> (1)..(445)
 <223>

<400> 6
 aagcttgac gaggcaaagc aaaggttggt tgttggtggt gttgagagac actccaatcc

```

aacagatac aaggcgtgac tggatatttc tctctcgttc ctaacaacag caacgaagaa 120
gaaaaagaat cactactaac aatcaatgag tatgagagct ggacacatga cggcaacaat 180
ggcggctttt acatgcccta ggtttatgac tagcatcaga tacacgaagc aaattaagtg 240
caacgctgct aaaagccagc tagtcggtta acaagagatt gaggaggaag aagattatgt 300
gaaagccggg ggcacggagc tgctttttgt tcaaatacaa cagaataagt ccatggatgc 360
acagtctagc ctatcccaaa agctcccaag ggtaccaata ggaggaggag gagacagtaa 420
ctgtatactg gatttggttg tcgac 445

```

```

<210> 7
<211> 446
<212> DNA
<213> tagetes erecta

```

```

<220>
<221> antisense fragment
<222> (1)..(446)
<223>

```

```

<400> 7
gaattcgcac gaggcaaagc aaagggtggt tggtggtggt gttgagagac actccaatcc 60
aacagatac aaggcgtgac tggatatttc tctctcgttc ctaacaacag caacgaagaa 120
gaaaaagaat cactactaac aatcaatgag tatgagagct ggacacatga cggcaacaat 180
ggcggctttt acatgcccta ggtttatgac tagcatcaga tacacgaagc aaattaagtg 240
caacgctgct aaaagccagc tagtcggtta acaagagatt gaggaggaag aagattatgt 300
gaaagccggg ggcacggagc tgctttttgt tcaaatacaa cagaataagt ccatggatgc 360
acagtctagc ctatcccaaa agctcccaag ggtaccaata ggaggaggag gagacagtaa 420
ctgtatactg gatttggttg gaccc 446

```

```

<210> 8
<211> 393
<212> DNA
<213> Tagetes erecta

```

```

<220>
<221> sense fragment
<222> (1)..(393)
<223>

```

```

<400> 8

```



```

aagcttttggga ttagcactga ttgtccagat ggatattgag gggacccgca cattcttccg      60
gacttttcttc cgcttgccca catggatgtg gtggggggtt cttggatctt cgttatcatc      120
aactgacttg ataatatattg cgttttacat gtttatcata gcaccgcata gcctgagaat      180
gggtctgggtt agacatttgc tttctgaccc gacaggagga acaatgttaa aagcgtatct      240
cacgatataa ataactctag tcgcgatcag tttagattat aggcacatct tgcatatata      300
tatgtataaa ccttatgtgt gctgtatcct tacatcaaca cagtcattaa ttgtatttct      360
tggggtaatg ctgatgaagt attttctgtc gac                                     393

```

```

<210> 9
<211> 397
<212> DNA
<213> Tagetes erecta

```

```

<220>
<221> AntisenseFragment
<222> (1)..(397)
<223>

```

```

<400> 9
gaattctctt tggattagca ctgattgtcc agatggatat tgagggggacc cgcacattct      60
tccggacttt cttccgcttg cccacatgga tgtgggtgggg gtttcttgga tcttcgttat      120
catcaactga cttgataata tttgcgtttt acatgtttat catagcaccg catagcctga      180
gaatgggtct ggtagacat ttgctttctg acccgacagg aggaacaatg ttaaaagcgt      240
atctcagcat ataaataact ctagtcgcga tcagtttaga ttataggcac atcttgcata      300
tatatatgta taaaccttat gtgtgctgta tccttacatc aacacagtca ttaattgtat      360
ttcttggggg aatgctgatg aagtattttc tggatcc                                     397

```

```

<210> 10
<211> 1537
<212> DNA
<213> -

```

```

<220>
<221> promoter
<222> (1)..(1537)
<223>

```

```

<400> 10
gagctctaca aattagggtt actttattca ttttcatcca ttctctttat tgttaaattt      60
tgtacattta ttcaataata ttatatgttt attacaaatt ctcactttct tattcatacc      120

```

tattcactca agcctttacc atcttccttt tctatttcaa tactatttct acttcatttt	180
tcaogttttt aacatctttc tttatttctt gtccacttcg tttagggatg cctaagtgtcc	240
caaatttcat ctctcgtagt aacacaaaac caatgtaatg ctacttctct ctacattttt	300
aatacaaata aagtgaaaca aaatatctat aaataaaca atatatatat tttgttagac	360
gctgtctcaa cccatcaatt aaaaaatttt gttatatttc tactttacct actaaatttg	420
tttctcatat ttacctttta acccccacaa aaaaaaatta taaaaaagaa agaaaaaagc	480
taaaccctat ttaaataagct aactataaga tcttaaaatt atcctcatca gtgtatagtt	540
taattgggta ttaacttata acattatata tctatgacat atactctctc ctagctattt	600
ctcacatttt ttaacttaag aaaatagtca taacatagtc taaaattcaa acatccacat	660
gctctaattt gattaacaaa aagttagaaa tattttattta aataaaaaag actaataaat	720
atataaaatg aatgttcata cgcagacca tttagagatg agtatgcttt cacatgctga	780
gattattttc aaaactaagg ttgtagcaat attaaatcaa taaaattatt ataaataaca	840
aaattaacct gctcgtgttt gctgtatatg ggaggctaca aaataaatta aactaaagat	900
gattatgttt tagacatttt ttctatctgt attagtttat acatattaat tcaggagctg	960
cacaacccaa ttctattttc gttccttggt ggctgggttt ctcaacagg tcaatagtca	1020
atattaggtt ttattggact tttaatagta tcaaacaaat ctatgtgtga acttaaaaat	1080
tgtattaaat atttagggta acctgttgcc gtttttagaa taatgtttct tcttaataca	1140
cgaaagcgta ttgtgtattc attcatttgg cgctcacat gcttcggttg gctcgttta	1200
gtctctgcct tctttgtata ttgtactccc cctcttccta tgccacgtgt tctgagctta	1260
acaagccacg ttgcgtgcc a ttgccaaaca agtcatttta acttcacaag gtccgatttg	1320
acctccaaaa caacgacaag tttccgaaca gtcgcgaaga tcaagggtat aatcgtcttt	1380
ttgaattcta tttctcttta tttaatagtc cctctcgtgt gatagttttt aaaagatttt	1440
taaaacgtag ctgctgttta agtaaatccc agtccttcag tttgtgcttt tgtgtgtttt	1500
gtttctctga ttacggaat ttggaaataa taagctt	1537

<210> 11
 <211> 734
 <212> DNA
 <213> artificial sequence

<220>
 <221> variation

<222> (1)..(734)
 <223>

<400> 11

```

ctaacaatca atgagtagag agctggacac atgacggcaa caatggcggc ttttacatgc      60
cctaggttta tgactagcat cagatacacg aagcaaatta agtgcaacgc tgctaaaagc     120
cagctagtcg ttaaacaaga gattgaggag gaagaagatt atgtgaaagc cgggtggatcg     180
gagctgcttt ttgttcaaat gcaacagaat aagtccatgg atgcacagtc tagcctatcc     240
caaaagggtca ctccagactt aattgcttat aaataaataa atatgttttt taggaataat     300
gatatttaga tagattagct atcacctgtg ctgtgggtgtg cagctcccaa gggctcttacc     360
gatagtaaaa tcgttagtta tgattaatac ttgggagggtg ggggattata ggctttgttg     420
tgagaatggt gagaaagagg tttgacaaat cgggtgtttga atgagggttaa atggagttta     480
attaaaataa agagaagaga aagattaaga gggatgatggg gatattaaag acggscaata     540
tagtgatgcc acgtagaaaa aggtaagtga aaacatacaa cgtggcttta aaagatggct     600
tggtgcttaa tcaactcaac tcaactcata tcctatccat tcaaattcaa ttcaattcta     660
ttgaatgcaa agcaaagcaa aggttgtttg ttgttgttgt tgagagacac tccaatccaa     720
acagatacaa ggcg                                           734

```

<210> 12
 <211> 280
 <212> DNA
 <213> artificial sequence

<220>
 <221> variation
 <222> (1)..(280)
 <223>

<400> 12

```

gtcagagtatg gagttcaatt aaaataaaga gaagaraaag attaagaggg tgatggggat      60
attaaagacg gccaatrtag tgatgccacg taagaaaaag gtaagtgaac acatacaacg     120
tggttttaaa agatggcttg gctgctaate aactcaacte aactcatatc ctatccattc     180
aaattcaatt caattctatt gaatgcaaag caaagcaaag caaaggttgt ttgttgttgt     240
tggtgagaga cactccaate caaacagata caaggcgtga                                           280

```

<210> 13
 <211> 358

<212> DNA
 <213> *Tagetes erecta*

<220>
 <221> (sense) promotor
 <222> (1)..(358)
 <223>

<400> 13
 aagcttaccg atagtaaaat cgtaggttat gattaatact tgggaggtgg gggattatag 60
 gctttgttgt gagaatgttg agaaagaggt ttgacaaatc ggtgtttgaa tgagggttaa 120
 tggagtttaa ttaaaataaa gagaagagaa agattaagag ggtgatgggg atattaaaga 180
 cggccaatat agtgatgcca cgtagaaaaa ggtaagtga aacatacaac gtggctttaa 240
 aagatggctt ggctgctaact caactcaact caactcatat cctatccatt caaattcaat 300
 tcaattctat tgaatgcaaa gcaaagcaaa gcaaagggtt tttgttggtt ttgtcgac 358

<210> 14
 <211> 361
 <212> DNA
 <213> *Tagetes erecta*

<220>
 <221> (antisense) promotor
 <222> (1)..(361)
 <223>

<400> 14
 ctcgagctta ccgatagtaa aatcgtagt tatgattaat acttgggagg tgggggatta 60
 taggctttgt tgtgagaatg ttgagaaaga ggtttgacaa atcgggtgtt gaatgaggtt 120
 aaatggagtt taattaaaat aaagagaaga gaaagattaa gaggggtgatg gggatattaa 180
 agacggccaa tatagtgatg ccacgtagaa aaaggtaagt gaaaacatac aacgtggctt 240
 taaaagatgg cttggctgct aatcaactca actcaactca tatectatcc attcaaattc 300
 aattcaattc tattgaatgc aaagcaaagc aaagcaaagg ttgtttgttg ttgttgatc 360
 c 361

<210> 15
 <211> 28
 <212> DNA
 <213> artificial sequence

<220>
 <221> Primer

<222> (1)..(28)
<223>

<400> 15
gagctcactc actgatttcc attgcttg

28

<210> 16
<211> 37
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(37)
<223>

<400> 16
cgccgttaag tcgatgtccg ttgatttaaa cagtgtc

37

<210> 17
<211> 34
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(34)
<223>

<400> 17
atcaacggac atcgacttaa cggcgtttgt aaac

34

<210> 18
<211> 25
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(25)
<223>

<400> 18
taagcttttt gttgaagaga tttgg

25

<210> 19
<211> 23
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(23)
<223>

<400> 19
gaaaataactt catcagcatt acc

23

<210> 20
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 20
gtcgactacg taagtttctg cttctacc

28

<210> 21
<211> 26
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(26)
<223>

<400> 21
ggatccggtg atacctgcac atcaac

26

<210> 22
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 22
aagcttgcac gaggcaaagc aaaggttg

28

<210> 23

<211> 29
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(29)
<223>

<400> 23
gtcgacaacc aaatccagta tacagttac

29

<210> 24
<211> 30
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(30)
<223>

<400> 24
aggatccaac caaatccagt atacagttac

30

<210> 25
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 25
gaattcgac gaggcaaagc aaaggttg

28

<210> 26
<211> 25
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(25)
<223>

<400> 26
aagctttgga ttagcactga ttgtc

25

<210> 27
<211> 29
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(29)
<223>

<400> 27
gtcgacagaa aatacttcat cagcattac

29

<210> 28
<211> 29
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(29)
<223>

<400> 28
ggatccagaa aatacttcat cagcattac

29

<210> 29
<211> 27
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(27)
<223>

<400> 29
gaattctctt tggattagca ctgattg

27

<210> 30
<211> 23
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(23)
<223>

<400> 30
cgcccttgat ctgtttggat tgg 23

<210> 31
<211> 24
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(24)
<223>

<400> 31
ctaacaatca atgagtatga gagc 24

<210> 32
<211> 26
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(26)
<223>

<400> 32
agagcaaggc cagcaggacc acaacc 26

<210> 33
<211> 26
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(26)
<223>

<400> 33
ccttgggagc ttttgggata ggctag 26

<210> 34
<211> 26
<212> DNA
<213> artificial sequence

<220>
<221> Primer

<222> (1)..(26)
<223>

<400> 34
tcacgccttg tatctgtttg gattgg

26

<210> 35
<211> 15
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(15)
<223>

<400> 35
gtcgagtatg gagtt

15

<210> 36
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 36
aagcttaccg atagtaaaat cgttagtt

28

<210> 37
<211> 31
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(31)
<223>

<400> 37
ctcgagctta ccgatagtaa aatcgttagt t

31

<210> 38
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 38
gtcgacaaca acaacaaaca acctttgc

28

<210> 39
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 39
ggatccaaca acaacaaaca acctttgc

28

<210> 40
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 40
gtcgactttt tgttgaagag atttggtg

28

<210> 41
<211> 28
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(28)
<223>

<400> 41
ctcgagactc actgatttcc attgcttg

28

<210> 42

<211> 22
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(22)
<223>

<400> 42
gagctctaca aattagggtt ac

22

<210> 43
<211> 23
<212> DNA
<213> artificial sequence

<220>
<221> Primer
<222> (1)..(23)
<223>

<400> 43
aagcttatta tttccaaatt ccg

23